

Commercial Standard 164E-50

CONCRETE MIXERS (Construction Mixers and Pavers)

(EXPORT CLASSIFICATION)

A RECORDED VOLUNTARY STANDARD OF THE TRADE

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UNITED STATES DEPARTMENT OF COMMERCE

Charles Sawyer, Secretary

APRIL 5, 1951
TS-5076

ADDENDUM TO
CONCRETE MIXERS (CONSTRUCTION MIXERS AND PAVERS)
(EXPORT CLASSIFICATION) COMMERCIAL STANDARD CS164E-50

PARAGRAPH 2.3, LINE 2: CHANGE "ONE SIZE, 34 CUBIC FEET" TO
READ "TWO SIZES, 16 CUBIC FEET AND 34 CUBIC FEET".

PARAGRAPH 4.2.2: CHANGE PARAGRAPH TO READ "TRACTION.—
PAVING MIXERS SHALL BE SUPPLIED WITH POWER TRACTION.
THE MAXIMUM AND MINIMUM SPEEDS FOR CRAWLER MOUNTED PAVERS
SHALL BE AS FOLLOWS:" FOLLOWED BY (1) AND (2).

PARAGRAPH 4.2.4.2 (2): CHANGE "ONE SIZE" TO READ "TWO
SIZES".

TABLE 6: INSERT "16E, 16, 453.1, 0.45, 2" IN COLUMNS ONE
THROUGH FIVE RESPECTIVELY.

TABLE 7: INSERT IN COLUMN 1 "PNEUMATIC TIRES" AS THE THIRD
ITEM.

INSERT NEW COLUMN UNDER "SIZE" HEADED "16E—TWO-COMPART-
MENT".

INSERT IN COLUMN FOR 16E TWO-COMPARTMENT PAVER THE
FOLLOWING:

"BASIC" FOR INTERNAL-COMBUSTION ENGINE, PNEUMATIC
TIRES, CHARGING SKIP, WATER-MEASURING TANK,
STANDARD STORAGE TANK, BATCH-TIMING METER, HOR-
IZONTAL BOOM AND DISTRIBUTING BUCKET.

"OPTIONAL" FOR OVERSIZE AUXILIARY STORAGE TANK,
AUXILIARY WATER PUMP, LONGER OR SHORTER BOOM,
POWER-DRIVEN MECHANISM FOR OPERATING STRIKE-OFF
TEMPLATE.

BLANK SPACES FOR FULL CONTINUOUS TREAD, AND BATCH
BOX DERRICK.

TABLE 8: INSERT "16E, 4.27, 3.92, 2" IN COLUMNS ONE
THROUGH FOUR RESPECTIVELY.

TABLE 9: INSERT "16E, 2, 30, 113.6, 150, 567.8, 300 TO
400, 1,136 TO 1,514" IN COLUMNS ONE THROUGH EIGHT
RESPECTIVELY.

PARAGRAPH 4.2.11 TO READ AS FOLLOWS: "PAVER BOOM AND
BUCKET ATTACHMENTS HAVING A SPREADING REACH OF 22 FT
(6.7M) FOR THE 16E TWO-COMPARTMENT PAVING MIXER,
27 FT 6 IN. (8.38M) FOR THE 27E SINGLE PAVING
MIXER...." CONTINUE AS GIVEN IN TEXT.

Concrete Mixers

(Construction Mixers and Pavers)

(EXPORT CLASSIFICATION)

[Effective October 1, 1950]

1. PURPOSE

1.1 The purpose of this commercial standard is to set up definitions and requirements, as a basis for fair competition and a better understanding between buyers and sellers of standard construction and paving mixers for export from the United States of America.

2. SCOPE

2.1 This commercial standard covers the following types and sizes of single rotating-drum construction mixers and paving mixers, which are considered standard in the industry:

2.2 *Construction mixers.*

2.2.1 *Nontilting type.*—Eight sizes ranging from $3\frac{1}{2}$ to 112 cu ft nominal capacity of mixed concrete, with single-compartment, two-opening drum; and one size, 35 cu ft nominal capacity, with two-compartment, three-opening drum.¹

2.2.2 *Tilting type.*—Five sizes (3½S, 6S, 56S, 84S, and 112S) with single-opening drum, five sizes (3½S, 28S, 56S, 84S, and 112S) with horizontal double-cone two-opening rear charge and front discharge drums, and three sizes (56S, 84S, and 112S) with double-cone two-opening front charge and discharge drums.

2.3 *Paving mixers.*—Two sizes, 27 cu ft and 34 cu ft nominal capacity of mixed concrete, with single-compartment, two-opening drum; and one size, 34 cu ft nominal capacity, with two-compartment, three-opening drum.¹

2.4. The commercial standard sets up uniform methods of taking dimensions, and of determining working ranges that are to be furnished for comparison of models offered by manufacturers for export from the United States of America. It also covers a uniform method of labeling and of certifying compliance with the standard.

3. GENERAL REQUIREMENTS

3.1 *Drum capacities* shall be given in cubic feet.

3.2 *Water tank capacities* shall be given in U. S. gallons.

3.3 *Closed-type water-measuring tanks* shall be built for a working pressure of 150 lb per sq in. (10.55 kg per sq cm).

3.4 *Shafts, keys, and keyways.*—A. S. M. E. standard sizes of shafts,

¹ The third opening refers to the transfer opening between drum compartments.

keys, and keyways shall be used wherever the nature of the design permits.

3.5 Tools.

3.5.1 *Common tools* shall not be standard with construction mixers and pavers.

3.5.2 *Special tools* necessary to the proper adjustment and maintenance of construction mixers and paving mixers shall be furnished.

3.6 *Lubricating devices* shall be furnished and readily accessible.

3.7 *Instructions for assembly, care, and safe operation* of the machine shall be supplied by the manufacturer.

3.8 *Controls for operation of machine* shall be readily accessible from operator's position.

3.9 *Horsepower ratings* for internal-combustion engines shall be the ratings taken from the engine manufacturer's published curve at sea level operation, with deductions for accessories. If such a curve is not available, a 10-percent deduction for standard accessories shall be made from the horsepower rating shown on the stripped engine curve.

3.9.1 Wherever internal-combustion-engine horsepower ratings are shown in construction mixer or paving mixer manufacturer's literature or advertising, the cubic-inch displacement and engine rpm at rated drum speed shall be included.

3.10 Safety.²

3.10.1 *Gears, shafts, drive chains, pulleys, sheaves, and belts* shall be totally enclosed or safely guarded by the manufacturer.

3.10.2 *Machinery access covers* shall be supplied, and the user is cautioned to keep them in place and secured when equipment is in operation.

3.10.3 *Skip guards* shall be installed on all types of paving mixers to give protection to both sides of the loading skip.

3.10.4 *Safety skip holding chains* or other positive holding means shall be standard equipment.

3.10.5 *Signaling device* shall be standard equipment on all paving mixers, to be used as a warning when the machine is to be moved.

3.10.6 *Cleaning of drum.*—If a drum has to be entered for cleaning purposes, the engine should be stopped and securely locked or otherwise taken completely out of service by removal of some vital part of the ignition system. If electric-motor-driven, the main switch should be locked or the fuses removed.

4. DETAIL REQUIREMENTS

4.1 Construction Mixers

4.1.1 *Size designation.*—The size of a construction mixer shall be designated by a number which shall be the nominal capacity of the mixer in cubic feet of *mixed* concrete, followed by the letter "S." The letter "S," for all construction mixers, may be followed by any other designation of the individual manufacturer's code.

4.1.2 *Types.*—Construction mixers shall be made in two types: (a) nontilting-type drum (see figs. 2, 3, and 4), and (b) tilting-type drum (see figs. 1, 5, and 6).

² Items included in this section were developed in cooperation with the Construction Section of the National Safety Council. For a complete discussion of mixer and paver operation safety rules, see Industrial Data Sheet D-Con. 7, Concrete Mixers and Pavers, obtainable from the National Safety Council, 20 North Wacker Dr., Chicago, Ill. See also Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, Inc., 1227 Munsey Building, Washington 4, D. C.

4.1.3 *Traction*.—Power traction shall not be furnished on any construction mixer.

4.1.4 *Capacities*.—The guaranteed capacities of construction mixers shall be the nominal capacity plus 10 percent. Construction mixers shall hold and properly mix their guaranteed capacities when operated in a level position.

4.1.5 *Drums*.—Construction mixers shall be manufactured with a single rotating drum.

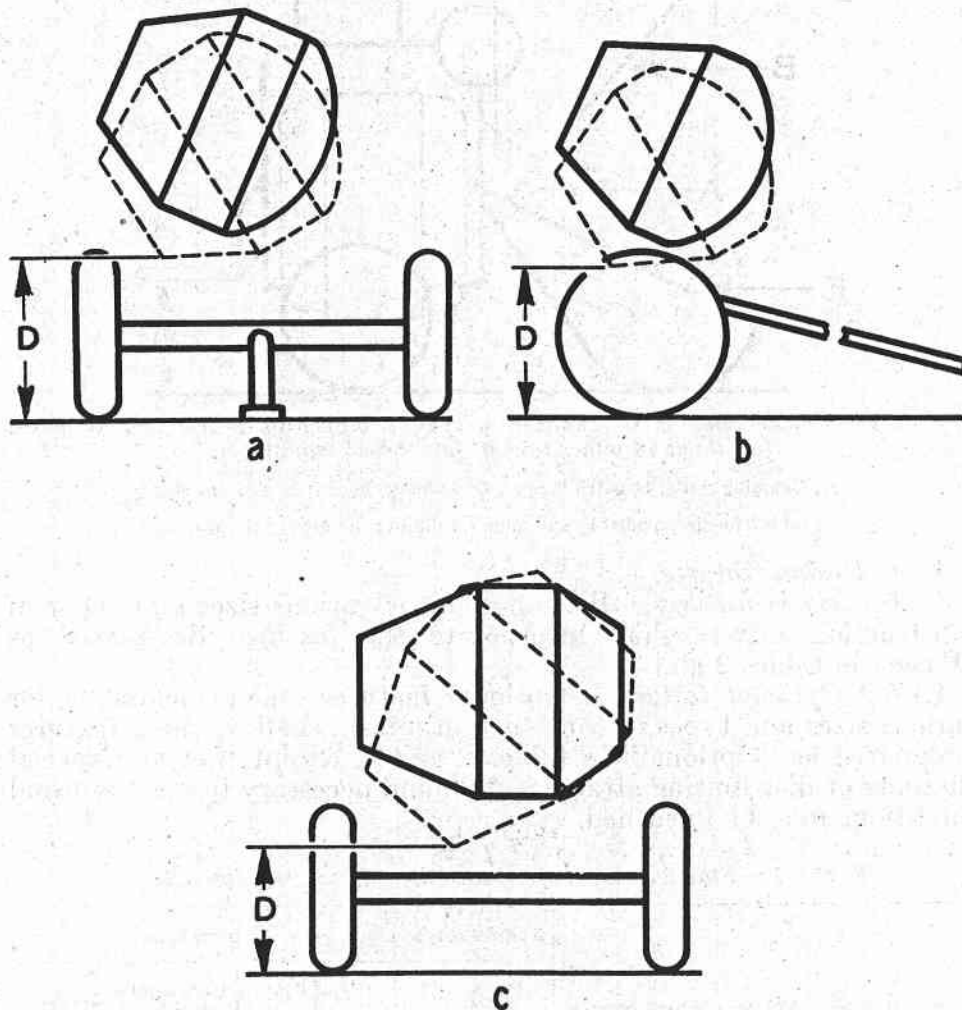


FIGURE 1.—Construction mixers, tilting type.

a, Side discharge, one-opening drum; b, end discharge, one-opening drum; c, side discharge, two-opening drum.

D, Discharge height.

(See table 3 for sizes available, and table 4, column 3, for drum volume ratios.)

4.1.5.1 *Classes*.—Three classes of drum constructions are standard in the industry:

- (a) Single-compartment, one-opening drum.
- (b) Single-compartment, two-opening drum.
- (c) Two-compartment, three-opening drum.

4.1.5.2 *Sizes*:

- (a) *Single-compartment*.—There are eight sizes of single-com-

partment-drum construction mixers which are considered standard in the industry (see table 1).

(b) *Two-compartment*.—One size of two-compartment drum mixer shall be standard (see table 1).

(c) *No intermediate sizes* shall be standard. Sizes below 3½S and above 112S may be manufactured but shall not be standard.

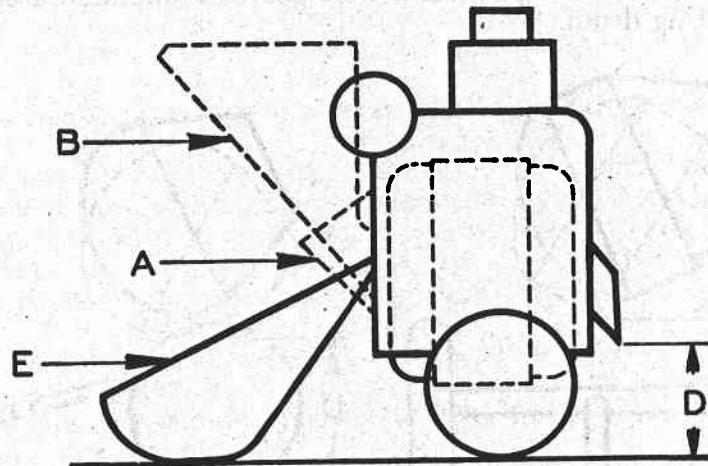


FIGURE 2.—Construction mixer, nontilting type, two-opening drum, end hargeiscd (available in either two- or four-wheel mounting).

A, Charging chute; B, batch hopper; D, discharge height; E, charging skip.

(See table 2 for sizes available, and table 4, column 1, for drum volume ratios.)

4.1.6 Design features.

4.1.6.1 *Basic features*.—Basic design for various sizes and types of construction mixers shall incorporate the features designated as "Basic" in tables 2 and 3.

4.1.6.2 *Optional features*.—Optional features and attachments for various sizes and types of construction mixers shall be those features designated as "Optional" in tables 2 and 3, except that any special charging or distributing attachments found necessary to meet unusual conditions may be furnished.

TABLE 1.—Standard sizes of construction mixers (see figs. 1 to 6)

Nominal mixer size designation	Volume of mixed concrete per batch ¹			Nontilting type		Tilting type			
				Compartments	Openings	Compartments	Openings	Horizontal double-cone, rear charge, front discharge opening	Double-cone, front charge and discharge opening
3½S	cu ft 3½	liters 99.1	cu m 0.10	1	2	1	1	2	
6S	6	169.9	.17	1	2	1	1		
11S	11	311.5	.31	1	2				
16S	16	453.1	.45	1	2			2	
28S	28	793.0	.79	1	2				
35S	35	991.2	.99	2	2 3				
56S	56	1,586.0	1.58	1	2	1	1	2	1
84S	84	2,378.9	2.38	1	2	1	1	2	1
112S	112	3,171.8	3.17	1	2	1	1	2	1

¹ For guaranteed working capacity, see par. 4.1.4.

² Usually a special-purpose or tunnel mixer.

TABLE 2.—Basic and optional features of nontilting-drum-type construction mixers (see figs. 2, 3, and 4)

Features	Sizes								
	3½S	6S	11S	16S	28S	36S	56S	84S	112S
2-opening drum.....	BASIC	BASIC	BASIC	BASIC	BASIC	BASIC	BASIC	BASIC	BASIC.
3-opening drum.....	BASIC	BASIC	BASIC	BASIC	Optional	Optional			
End discharge, 2-wheel mounting.....		Optional	Optional	Optional	do				
End discharge, 4-wheel mounting.....		do	do	do	do				
Side discharge, 4-wheel mounting.....		do	do	do	do				
Steel wheels.....	Optional	BASIC	BASIC	BASIC	do				Optional.
Pneumatic tires.....	BASIC	do	do	do	do	Optional	Optional	Optional	Do.
Charging skip.....		Optional	Optional	Optional	do	do			
Gated batch hopper.....		do	do	do	do				
Charging chute.....	BASIC	do	do	do	do				Optional.
Low-charge platform.....		do	do	do	do	Optional	Optional	Optional	Do.
Water-measuring tank.....	Optional	BASIC	BASIC	BASIC	Optional	do	do	do	
Water-storage tank.....		Optional	Optional	Optional	do	do	do	do	
Batch-timing meter.....		do	do	do	do	do	do	do	
Water-supply pump.....		do	do	do	do	do	do	do	
Distributing spout.....		do	do	do	Optional				
Extension loader.....		do	do	do					
Hoist.....	Optional	do	do	do	BASIC	BASIC	BASIC	BASIC	BASIC.
Skids.....	do	do	do	do	Optional	Optional	Optional	Optional	Optional.
Diesel engine.....	do	do	do	do	do	do	do	do	Do.
Electric motor.....	do	do	do	do	do	do	do	do	Do.
Gasoline engine.....	BASIC	BASIC	BASIC	BASIC	do	do	do	do	BASIC.
Without power.....	Optional	Optional	Optional	Optional	BASIC	BASIC	BASIC	BASIC	

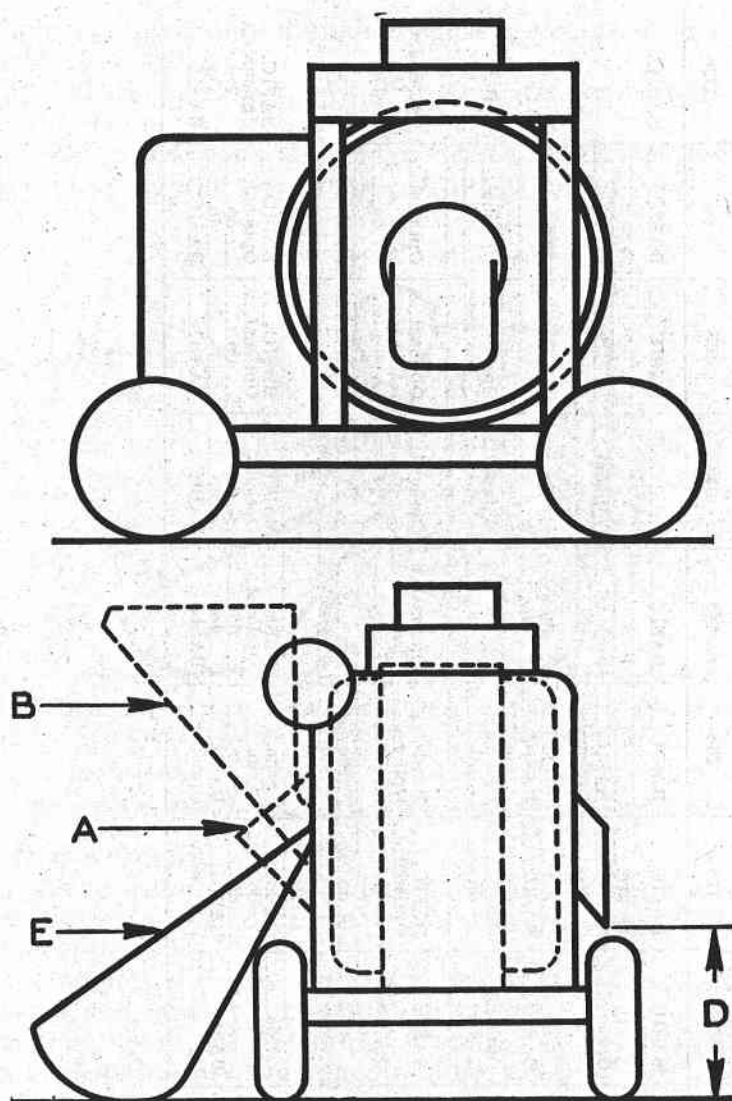


FIGURE 3.—Construction mixer, nontilting type, four-wheel, two-opening drum, side discharge (side and end views).

A, Charging chute; B, batch hopper; D, discharge height; E, charging skip.

(See table 2 for sizes available, and table 4, column 1, for drum volume ratios.)

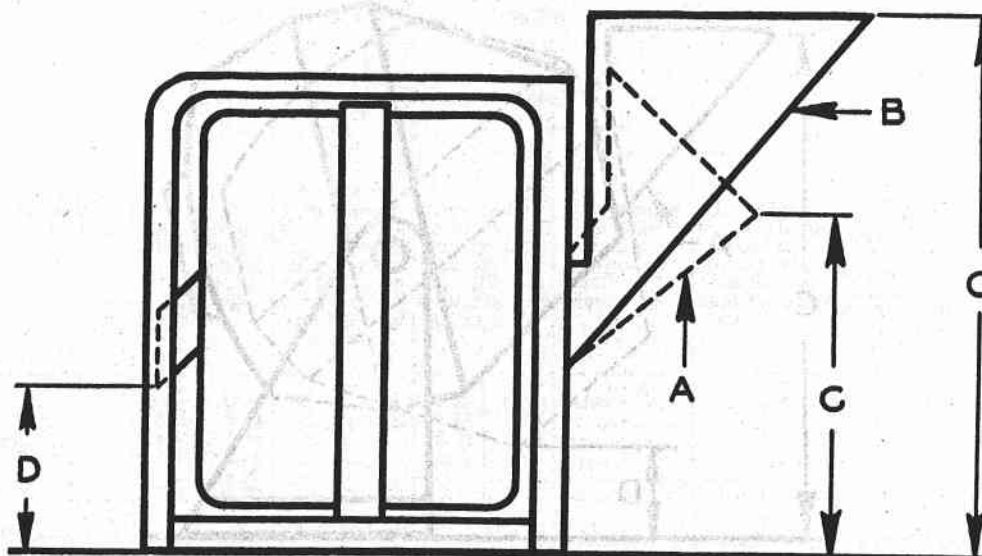


FIGURE 4.—Construction mixer, non-tilting type, stationary, two-opening drum.

A, Charging chute; B, batch hopper; C, charging height; D, discharge height.

(See table 2 for sizes available, and table 4, column 1, for drum volume ratios.)

TABLE 3.—Basic and optional features of tilting-drum-type construction mixers (see figs. 1, 5, and 6)

Features	Sizes					
	3½S	6S	28S	56S	84S	112S
One-opening drum.....	BASIC	BASIC		BASIC	BASIC	BASIC
Two-opening drum.....	do.		BASIC	do.	do.	Do.
End discharge.....	Optional	Optional				
Side discharge.....	BASIC	BASIC				
Two-wheel mounting.....	do.	do.				
Steel wheels.....	Optional	Optional				
Pneumatic tires.....	BASIC	BASIC				
Gated batch hopper.....	Optional		Optional	Optional	Optional	Optional
Charging chute.....	do.	Optional	do.	do.	do.	Do.
Water-measuring tank.....	do.	do.	do.	do.	do.	Do.
Water-storage tank.....			do.	do.	do.	Do.
Batch-timing meter.....			do.	do.	do.	Do.
Skids.....	Optional	Optional	do.	do.	do.	Do.
Gasoline engine.....	BASIC	BASIC				
Diesel engine.....	Optional	Optional	Optional	Optional	Optional	Optional
Electric motor.....	do.	do.	do.	do.	do.	Do.
Without power.....	do.	do.	BASIC	BASIC	BASIC	BASIC

4.1.7 *Drum volume.*—The total interior drum volume (geometric solid) of any single-compartment construction mixer, or the total interior drum volume of each compartment of the two-compartment drum shall not be greater than the maximum ratio, nor less than the minimum ratio prescribed for its size and type as given in table 4, multiplied by its nominal designation (standard nominal size).

4.1.7.1 The maximum and minimum interior drum volume for the 11S construction mixer, for example, shall be computed as follows:

Maximum volume= $4.39 \times 11 = 48.29$ cu ft (1.37 cu m), (1,367.6 liters).

Minimum volume= $4.01 \times 11 = 44.11$ cu ft (1.25 cu m), (1,249.2 liters).

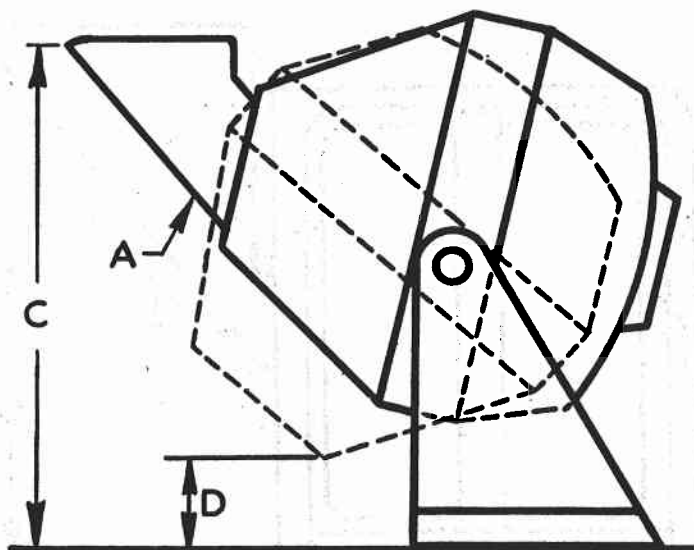


FIGURE 5.—Construction mixer, tilting type, stationary, front charge and discharge.

A, Charging chute; C, charging height; D, discharge height.

(See table 3 for sizes available, and table 4, columns 4 and 6, for drum volume ratios.)

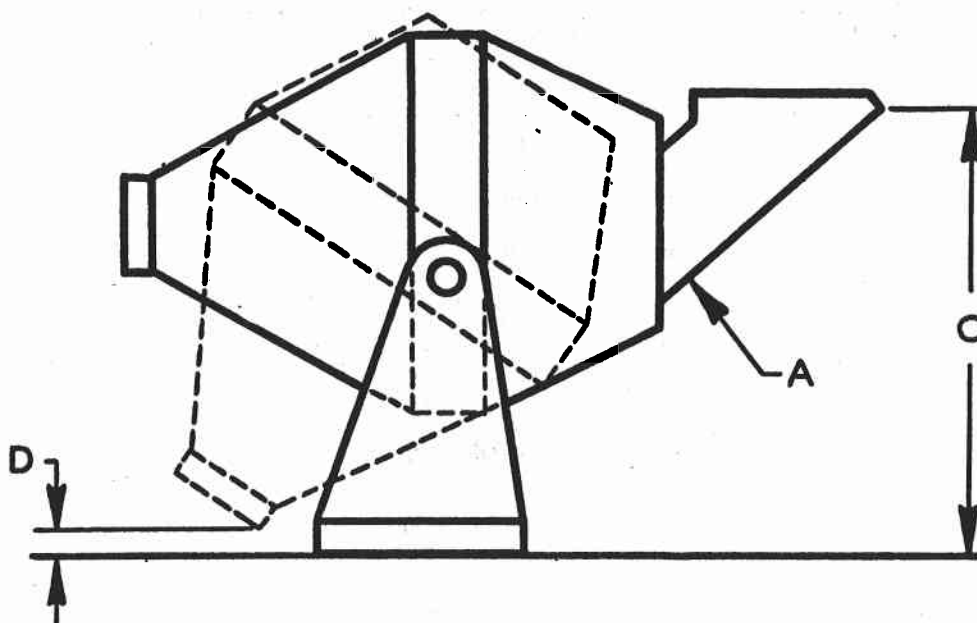


FIGURE 6.—Construction mixer, tilting type, stationary, horizontal double cone, two-opening drum, rear charge and front discharge.

A, Charging chute; C, charging height; D, discharge height.

(See table 3 for sizes available, and table 4, column 5, for drum volume ratios.)

TABLE 4.—Drum volume ratios for construction mixers

Nominal mixer size designation	Nontilting type				Tilting type							
	1		2		3		4		5		6	
	Single-compartment, two-opening mixer (see fig. 2, 3, or 4)		Two-compartment, three-opening mixer (max and min ratios apply to each compartment (no drawing shown))		One-opening small mixer—mixing angle of drum more than 15° with horizontal (see fig. 1a or 1b)		One-opening large mixer—mixing angle of drum 15° with horizontal (see fig. 5)		Large horizontal double-cone two-opening mixer, rear charge, front discharge (see fig. 6)		Large double-cone two-opening mixer, front charge and discharge—mixing angle of drum 5° with horizontal (see fig. 5)	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
3½S	4.70	4.10			3.13	2.53						
6S	4.57	4.09			3.05	2.56						
11S	4.39	4.01										
16S	4.27	3.92							4.40	4.10		
28S	4.06	3.76										
35S			4.03	3.73			3.10	2.70	4.20	3.93	4.00	3.80
56S	3.96	3.67					3.01	2.64	4.00	3.77	3.82	3.60
84S	3.92	3.62					2.95	2.61	3.80	3.60	3.65	3.45
112S	3.90	3.60										

4.1.8 *Water-measuring tanks.*—When supplied on construction mixers the water-measuring tank shall have sufficient capacity to deliver not less than the quantities of water per batch shown in table 5.

4.1.9 *Water-supply connections* shall be provided with all construction mixers. Size and type of connection are given in table 5.

TABLE 5.—Water-measuring tank minimum capacities, and water-supply connections for construction mixers

Nominal mixer size designation	Minimum water-measuring tank capacity		Water-supply tank connections			
			Hose		American Standard taper pipe thread size	
	U. S. gal.	liters	in.	mm	in.	mm
3½S	6	22.7	¾	19.1		
6S	10	37.9	¾	19.1		
11S	18	68.1	1	25.4		
16S	26	98.4			1¼	31.7
28S	46	174.1			2	50.8
35S	58	219.5			Not less than 2	50.8
56S	92	348.2			Not less than 2	50.8
84S	139	526.1			Not less than 3	76.2
112S	185	700.2			Not less than 3	76.2

4.2 Paving Mixers

4.2.1 *Size designation.*—The size of a paving mixer shall be designated by a number which shall be the nominal capacity of the mixer in cubic feet of *mixed* concrete, followed by the letter "E." The letter "E" for all paving mixers may be followed by any other designation of the individual manufacturer's code.

4.2.2 *Traction.*—Paving mixers shall be supplied with power traction with the following maximum and minimum speeds:

- (1) Maximum speed not greater than 1.8 miles per hour (2.9 km per hr).
- (2) Minimum speed not less than 0.5 mile per hour (0.8 km per hr).

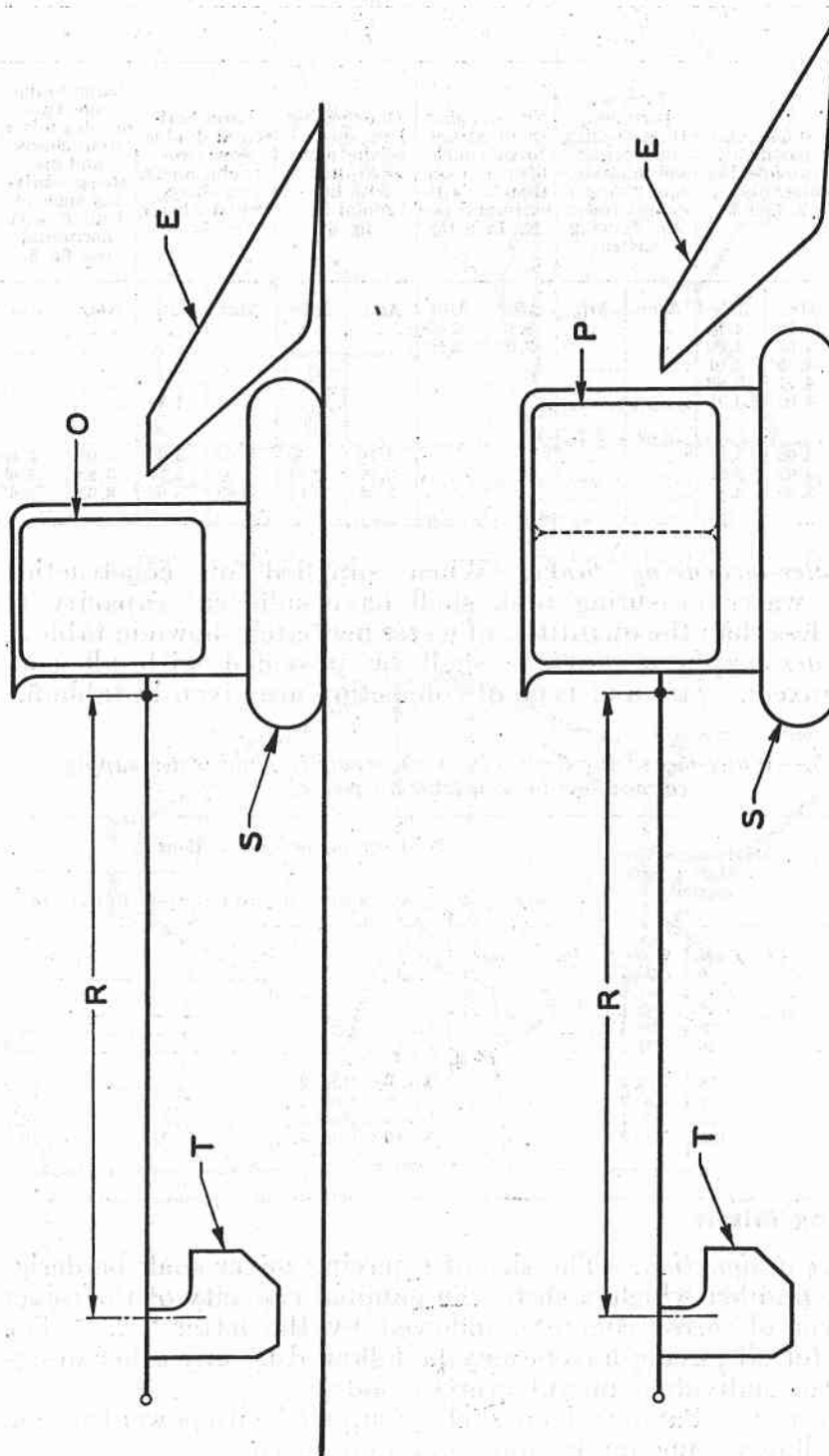


FIGURE 7.—Paving mixers (pavers).

E, Charging skip; O, single-compartment, two-opening drum; P, two-compartment, three-opening drum; R, spreading reach; S, tread or crawler; T, distributing bucket.

(See table 6 for sizes available.)

4.2.3 *Capacities.*—The guaranteed capacities of paving mixers shall be the nominal capacity plus 10 percent. Paving mixers shall hold and properly mix their guaranteed capacities when operating on a maximum grade of 6 percent.

4.2.4 *Drums.*—Paving mixers shall be manufactured with a single rotating drum.

4.2.4.1 *Classes.*—Two classes of drum construction are standard in the industry:

- (1) Single-compartment, two-opening.
- (2) Two-compartment, three-opening.

4.2.4.2 *Sizes.*—Standard sizes are:

- (1) Single-compartment—two sizes (see table 6).
- (2) Two-compartment—one size (see table 6).
- (3) No other sizes shall be standard.

TABLE 6.—Standard sizes of paving mixers

Nominal size designation of paver	Volume of mixed concrete per batch ¹			Number of compartments
	cu ft	liters	cu yds	
27E.....	27	764.6	0.75	1
34E.....	34	962.9	.96	1
34E.....	34	962.9	.96	2

¹ For guaranteed working capacity, see par. 4.2.3.

4.2.5 *Design features.*

4.2.5.1 *Basic features.*—Basic design for various sizes and types of paving mixers shall incorporate the features designated as "Basic" in table 7.

4.2.5.2 *Optional features.*—Optional features and attachments for various sizes and types of paving mixers shall be those features designated as "Optional" in table 7, except that any special charging or distributing attachments found necessary to meet unusual conditions may be furnished.

TABLE 7.—Basic and optional features of paving mixers (see fig. 7)

Features	Size		
	27E—single compartment	34E—single compartment	34E—two-compartment
Internal-combustion engine.....	BASIC.....	BASIC.....	BASIC
Full continuous tread.....	do.....	do.....	Do.
Charging skip.....	do.....	do.....	Do.
Water-measuring tank.....	do.....	do.....	Do.
Standard storage tank.....	do.....	do.....	Do.
Oversize auxiliary storage tank.....	Optional.....	Optional.....	Optional.
Auxiliary water pump.....	do.....	do.....	Do.
Batch-timing meter.....	BASIC.....	BASIC.....	BASIC.
Batch-box derrick.....	Optional.....	Optional.....	Optional.
Horizontal boom and distributing bucket.....	BASIC.....	BASIC.....	BASIC.
Longer or shorter boom.....	Optional.....	Optional.....	Optional.
Power-driven mechanism for operating strike-off template.....	do.....	do.....	Do.

4.2.6 *Drum volume.*—The total interior volume (geometric solid) of any single-compartment paving mixer, or the total interior drum volume of each compartment of the two-compartment drum shall not be greater than the maximum ratio, nor less than the minimum ratio

prescribed for its size and type as given in table 8, multiplied by its nominal designation (standard nominal size).

4.2.6.1 The maximum and minimum interior drum volume for the 34E paving mixer, for example, shall be computed as follows:

Maximum volume = $4.04 \times 34 = 137.4$ cu ft (3.89 cu m), (3,891.2 liters).
Minimum volume = $3.74 \times 34 = 127.2$ cu ft (3.60 cu m), (3,602.3 liters).

TABLE 8.—Drum volume ratios for paving mixers

Nominal size designation of paver	Drum volume ratio		Number of compartments
	Max	Min	
27E.....	4.08	3.77	1
34E.....	4.04	3.74	1
34E.....	4.04	3.74	2

4.2.7 *Water-measuring tanks.*—Paving mixers shall be equipped with a water-measuring tank of sufficient capacity (not including the standard or oversize auxiliary water-storage tank) to deliver not less than the quantity of water per batch given in table 9.

4.2.8 *Water-storage tanks.*

4.2.8.1 *Auxiliary water-storage tank.*—One standard auxiliary water-storage tank may be included with all pavers. The volume of this tank shall not exceed the capacity given in table 9.

4.2.8.2 *Oversize auxiliary water-storage tank.*—One oversize auxiliary water-storage tank, together with the necessary supporting structure, may be furnished in place of, or in addition to, the standard auxiliary water-storage tank as extra equipment. The total maximum and minimum capacities of auxiliary water-storage tanks shall be as given in table 9.

4.2.9 *Water supply connections* shall be provided with all paving mixers. Size of these connections shall be 2 in. (50.8 mm), American Standard taper pipe thread size.

TABLE 9.—Water-measuring and storage tanks for paving mixers

Nominal size designation of paver	Number of compartments	Tank capacity					
		Minimum water-measuring tank		Maximum standard auxiliary storage tank		Total capacity when oversize auxiliary storage tank is used	
		U. S. gal	liters	U. S. gal	liters	U. S. gal	liters
27E.....	1	48	181.7	150	567.8	450-550	1,703-2,082
34E.....	1	60	227.1	200	757.0	700-800	2,650-3,028
34E.....	2	60	227.1	200	757.0	700-800	2,650-3,028

4.2.10 *Paver boom and bucket attachments.*—The standard measurement of length for paver boom and bucket attachments shall be the spreading reach when the boom is horizontal. Spreading reach is defined as the distance from the boom pivot to a point on the distributing bucket when it is at the extreme end of its travel. See figure 7 for lengths when the following bucket arrangements are used:

(a) *For buckets with transversed hinged-type doors, except double*

opposed doors, this point shall be taken at the edge opposite to the door hinge of the extreme opening. (See fig. 7, dimension R.)

- (b) *For buckets with double opposed doors* or other types, this point shall be taken at the center of area of the opening or combined openings. (See fig. 7, dimension R.)

4.2.11 *Spreading reach*.—Paver boom and bucket attachments having a spreading reach of 27 ft 6 in. (8.38 m) for the 27E single paving mixer, and a spreading reach of 32 ft 6 in. (9.9 m) for the 34E single, and of 32 ft 6 in. for the 34E two-compartment paving mixer, shall be standard. Boom lengths, when referred to in advertising, catalogs, and other literature, shall be expressed in terms of nominal boom lengths, such as 30 ft (9.14 m), 35 ft (10.67 m), etc., which shall be in all cases $2\frac{1}{2}$ ft (0.76 m) greater than the corresponding spreading reach. Actual over-all boom dimensions which might vary from this may be shown only to indicate clearance or shipping dimensions. Longer or shorter attachments in multiples of 2 ft 6 in. may be advertised and furnished but only as extra equipment.

4.2.12 *Batch-box derrick* shall have a maximum reach of 14 ft (4.27 m) from center line of paving mixer; and where its use is required, not more than one shall be standard equipment for any paving mixer.

5. LABELING AND CERTIFICATION

5.1 *Identification plates*.—Plates shall be attached in a conspicuous place on each construction mixer and paving mixer which conforms to this commercial standard. On these plates will appear the name of the manufacturer, the nominal size designation of the machine, number of rotations of drum in revolutions per minute, and any other information desired by the manufacturer.

5.2 *Certification*.—In order to assure the purchaser that he is receiving a machine which complies with the requirements of this export standard, the manufacturer will attach in a conspicuous place in or on each machine a plate or label bearing the following wording:

The manufacturer declares that this machine complies with all requirements of Commercial Standard CS164E-50, Export, as developed by the trade under the procedure of the National Bureau of Standards, and issued by the Department of Commerce of the United States of America.

5.3 *Labeling*.—Figure 8 illustrates the label adopted by the members of the Mixer Manufacturers Bureau of the Associated General Contractors of America, Inc., to declare compliance of any particular machine with the applicable parts of this standard.

5.4 *Rating plate*.—In addition to the label shown in figure 8, the members of the Mixer Manufacturers Bureau will attach an A. G. C. (Associated General Contractors) standard rating plate to each construction mixer and paving mixer. Figure 9 illustrates the rating plate for the 11S mixer.



FIGURE 8.—Label adopted by the Mixer Manufacturers Bureau of the Associated General Contractors of America.



FIGURE 9.—A. G. C. standard rating plate for 11-S mixer.

6. DEFINITIONS AND NOMENCLATURE

6.1 GENERAL DEFINITIONS

A. CONCRETE MIXERS

Construction mixers and pavers.—Machines used to combine cement, water, and mineral aggregate to form concrete.

B. STANDARD CONCRETE MIXERS

Batch mixer (standard).—Standard concrete mixers (hereinafter referred to as mixers) are batch-type machines, designed to receive a controlled quantity of material at one time for mixing in a rotating drum, from which it is discharged before the receipt of another batch.

C. OPERATIONS OF A STANDARD MIXER

1. *Charging.*—The depositing of the unmixed cement, water, and mineral aggregate (the batch) in the drum.
2. *Mixing.*—The process of combining the batch to form concrete.
3. *Discharging.*—The removal of the mixed batch from the drum.

D. TYPES OF STANDARD MIXERS AND DRUMS—BY BASIC DESIGN

1. *Tilting drum type.*—A batch mixer in which the rotating axis of the drum is tipped from its mixing position to discharge.
2. *Nontilting-drum type.*—A mixer from which the mixed batch is discharged by mechanical means without changing the position of the rotating axis of the drum.
3. *Single-compartment drum.*—A mixer for mixing one batch at a time.
4. *Two-compartment drum.*—A mixer designed to produce more batches of mixed concrete per hour than a single-compartment mixer, by utilizing two full-size compartments and partially mixing every batch in each compartment.

E. TYPES OF STANDARD MIXERS—BASED ON THEIR USE

1. *Construction mixer (designated by letter "S").*—A batch mixer designed to meet the requirements of general construction work. (Not self-propelled.)
2. *Central-plant mixer (designated by letter "S").*—A medium- or large-size construction mixer for stationary operation in a permanent or semi-permanent mixing plant.
3. *Paving mixer (designated by letter "E").*—A self-propelled mixer especially designed and constructed for the placing of slab concrete.

F. TYPES OF STANDARD MIXERS—BY STYLE OF MOUNTING

1. *Two-wheel mounting.*—A mixer carried on two wheels steered with a towing pole.
2. *Four-wheel mounting.*—A mixer carried on four wheels with means incorporated in the front axle so that the machine can be steered with the towing pole.
3. *Skid mounting.*—A mixer mounted on timber or steel "runners" for convenience in handling.
4. *End-discharge mixer.*—A mixer with the axis of rotation of drum at right angles to the wheel axles or skids.
5. *Side-discharge mixer.*—A mixer with the axis of rotation of the drum parallel to the wheel axles or skids.
6. *Track mounting.*—A mixer mounted for use on railroad rails, usually used in tunnel construction.

6.2 PARTS AND COMPONENTS—MIXERS AND PAVERS

A. POWER SOURCE

1. *Internal-combustion engine.*
2. *Electric motor.*
3. *Without power.*—Input shaft on mixer is suitable for coupling direct, or through a reduction, with power source furnished by the customer.

B. POWER TRANSMISSION

1. *Transmission case*.—An enclosed oil or grease-tight case and mechanism.
2. *Power take-off drive*.—A drive from the power source.
3. *Countershaft*.—A main power-transmitting shaft for distributing power to different units of the mixer.
4. *Jackshaft*.—An intermediate shaft between a driver and driven shaft.
5. *Winding shaft*.—A shaft carrying drums or spools for winding cables.
6. *Main (or master) clutch*.—The clutch on the engine or countershaft for disconnecting all operating mechanism from the power source.
7. *Drum clutch*.—A clutch to disconnect the drum drive.
8. *Drum ring gear (gear-driven drum)*.—A gear encircling the mixing drum.
9. *Drum drive pinion*.—Pinion which drives the drum ring gear.
10. *Drum sprocket (chain-driven drum)*.—A sprocket encircling the mixing drum.
11. *Drum drive sprocket*.—A sprocket that drives the drum sprocket by means of a chain.
12. *Cable lift skip*.—A skip that is raised by the use of a cable-type hoist.
13. *Skip clutch*.—The clutch for the skip hoist drum.
14. *Skip clutch knock-out*.—A mechanism to automatically throw out the skip clutch when the skip reaches its raised position.
15. *Automatic skip brake*.—A brake interlocked with the skip clutch.
16. *Cable*.—A term meaning wire rope.
17. *Winding drum or spool*.—A small-diameter flanged drum for the skip cable (often grooved).
18. *Skip hoist*.—A unit for transmitting power to the winding shaft.
19. *Bull wheel*.—A large-diameter, flanged wheel for transmitting power to the winding shaft. The bull wheel is usually driven by a cable from the skip hoist.
20. *Bull gear or sprocket*.—A large-diameter gear used for turning the skip winding shaft by gear or chain drive.
21. *Hydraulic lift skip*.—A skip that is raised by the use of a hydraulic cylinder-type hoist.
22. *Hydraulic pump*.—A pump to convert mechanical energy into hydraulic energy to supply the hydraulic cylinder.
23. *Control chamber*.—A housing containing the various valves needed for controlling hydraulic or pneumatic power.
24. *Pressure cylinder*.—The chamber used to convert hydraulic or pneumatic energy into mechanical energy.
25. *Power-tilting mechanism*.—A device for positioning the mixing drum of tilting-type mixers for charging, mixing, or discharging.

C. MIXING DRUM: The receptacle in which the ingredients of the batch are mixed.

1. *Types of mixing drums*:
 - (a) Cylindrical with relatively flat heads—single-compartment, two-opening, or two-compartment, three-opening (nontilt only).
 - (b) Cylindrical with cone ends—single-compartment, two-opening, or two-compartment, three-opening (nontilt only).
 - (c) Conical with bowl bottom—single-opening (tilt only).
 - (d) Double conical (cone on each end), two-opening.
2. *Drum heads*.—The ends of the drum with the charging or discharging openings.
3. *Center drum head (dividing wall)*.—The separating partition of a two-compartment drum, with the transfer opening.
4. *Drum shell*.—That portion of the drum between the drum heads.
5. *Drum cone*.—The conical section of a drum.
6. *Drum track*.—The track around the drum on which the drum revolves on the supporting rollers.
7. *Buckets*.—Scoops which raise the materials, thus performing a part of the mixing operation and effecting discharge (nontilt drums only).
8. *Mixing blades*.—Blades placed in the drum to assist in the mixing operation.
9. *Drip ring*.—A flange or ring attached to the opening to reduce the amount of material spilling from the drum.
10. *Splash apron*.—A plate at charging and/or discharge opening to prevent splashing out of drum while mixing.
11. *Drum rollers*.—Supporting rollers upon which the mixing drum revolves.
12. *Guide (or edge) rollers*.—Auxiliary rollers to guide the drum endways. (Usually used on large tilting-type mixers.)

D. CHARGING

1. *Low charging.*—Provision for charging the mixing drum without use of a skip.
2. *Charging or feed chute.*—A chute fixed in the charging opening of the drum.
3. *Low-charge platform.*—A platform from which the unmixed batch is charged directly into the drum of low-charging mixers.
4. *Charging subchute.*—A stationary chute on the charging side of the mixer through which materials flow from charging skip in entering the drum.
5. *Gated batch hopper.*—A stationary hopper equipped with gates, which receives the full unmixed batch to be delivered to the drum.
6. *Charging skip.*—A bucket or receptacle which receives the unmixed batch and elevates it into the drum. (May have either an open or closed lower end.)
7. *Skip pivot shaft.*—The shaft which supports the skip in the mixer framing and about which it pivots.
8. *Skip tracks.*—The inclined supporting and guiding members used when the skip is equipped with rollers for movement between its loading and pivoting positions.
9. *Extension loader.*—Provision for lowering the skip below the level of the mixer for loading, by extended skip tracks.
10. *Skip shaker or vibrator.*—Means for shaking or vibrating the skip when in its elevated position to free any materials which adhered to the skip.

E. DISCHARGE AND ADJUNCTS

1. *Discharge chute.*—A chute entering, or in, the discharge side of the drum by which concrete is removed from the drum.
2. *Discharge subchute.*—A chute fixed at the discharge opening of the drum, which serves as an extension to the discharge chute when in the discharging position.
3. *Discharge operating mechanism.*—The manually or power-operated means for swinging the discharge chute into or out of discharge position, or tilting the drum from the mixing to discharge position, and vice versa.
4. *Distributing spout.*—A downwardly inclined long chute pivoted under the discharge chute and usually hung from the upper frame of the mixer.

F. TRANSFER AND ADJUNCTS—TWO-COMPARTMENT DRUMS ONLY

1. *Transfer chute or door.*—The means employed to move a batch from the first to the second compartment, and to prevent intermingling of batches during mixing.
2. *Chute (or door) shaft.*—A shaft which serves both to support and to operate the transfer means.
3. *Transfer seal.*—Means to minimize leakage of the batches between the drum compartments while mixing.

G. WATER SUPPLY

1. *Measuring tank—by volume.*
 - (a) Pressure type: Operates under pressure up to 150 lb per sq in., maximum; at atmospheric pressure while emptying. (Usually used on construction mixers; not permitted on pavers.)
 - (b) No-pressure type: Operates under atmospheric pressure at all times (required on pavers).
2. *Syphon type.*—Syphon principle utilized to discharge a given quantity of water from the tank.
3. *Draw-off type.*—Tank discharges by gravity a measured quantity of water.
4. *Check valve (for pressure-type tank only).*—A valve in the top of the tank to permit escape of air while tank is filling, and to admit air to allow tank to empty.
5. *Calibration plate.*—The indicator showing the amount of water that will be admitted to the batch; generally graduated in pounds and U. S. gallons.
6. *Regulator.*—The adjustable means for selecting the desired amount of batch water.
7. *Nozzle.*—The end of the pipe in the mixing drum, for directing the water entrance.
8. *Standard storage tank.*—Used to furnish measuring tanks with water at atmospheric pressure. Fitted with a float valve for controlling pressure supply.

9. *Auxiliary pump*.—Used to supply water to the mixer when a pressure source is not available, and utilizes the mixer power source for operating the pump.

H. FRAMES

1. *Lower frame*.—The basic structure supported by the mixer mounting, and on which the main units of the mixer are carried.
 2. *Upper frame*.—The frame which supports the upper units of the mixer.
- I. **LINER**: A replaceable plate provided at points or areas subject to extreme wear.

J. MISCELLANEOUS EQUIPMENT

1. *Batchmeter*.—A timing device which may be adjusted to the desired period of mixing of the batch, with or without means for preventing discharge until such period has been completed.
2. *Auxiliary hoist (for small construction mixers only)*.—A hoist which utilizes the power source on the mixer.

6.3 PARTS AND COMPONENTS—PAVERS ONLY

- A. **TREAD (OR CRAWLER)**. The mounting and propelling means for a paving mixer, consisting of two continuous tread belts driven by power.

1. *Tread shoes (or pads)*.—The individual members (pads) that make up the tread belts.
2. *Tread pins*.—Pins that connect the tread shoes.
3. *Tread rollers*.—Spaced rollers, mounted on the tread frame, which support the paver on the shoes.
4. *Tumbler*.—The sprocket at the driving end, provided with driving and guiding lugs for the tread shoes.
5. *Idler tumbler*.—The roller at the end opposite to the driving tumbler.
6. *Final drive*.—The chain or gear transmitting power to the tumbler.

- B. **GROUND PRESSURE** (common method of figuring). The figure obtained by dividing the weight of the paver by the area of the full width of the shoes, times twice the distance between the tumblers, in pounds per square inch. (This method assumes uniform load distribution and does not recognize operating loads or concentrations.)

- C. **POWER TRACTION AND STEERING**. A power-transmitting mechanism for controlling the direction and speed of the treads, and including means of steering.

1. *Traction clutch*.—A clutch to actuate the traction mechanism.
2. *Steering clutches and brakes*.—An interlocked clutch and brake for disconnecting and holding one tread while power is applied to the other, thereby steering the paver.

- D. **BOOM AND BUCKET MACHINERY**. The power-transmitting mechanism for operating the means of distributing the batch—bucket travel, bucket door, boom swing, and boom hoist.

- E. **DISTRIBUTING BUCKET**. The traveling bucket, equipped with a bottom door or doors, which receives the discharged batch and transports it to the desired point of placement along the boom.

1. *Transverse hinged door (single or double)*.—Hinged crosswise to the direction of bucket travel at one edge of the bottom opening for the single type, or at the approximate center of the double opening for the double type.
2. *Double opposed doors (radial or chordal section)*.—Act crosswise to the direction of bucket travel and work on the "clam shell" principle (usually pivoted on the sides of the bucket).
3. *Other type doors*.—Single radial, circular, or other.

- F. **BUCKET-DOOR CONTROL**. Means for opening the door at the point desired and for closing it in readiness to receive the next batch.

- G. **BUCKET CARRIAGE (OR TROLLEY).** The members from which the bucket hangs from the boom, fitted with rollers for traveling along its length.
- H. **BOOM.** The structural member serving as a support for the bucket and also as a track for the carriage. The boom is directly attached to the paver through a vertical pivot to permit sidewise swing, and a horizontal pivot to permit raising or lowering by the holding or "main hoist" cable attached to the boom and the upper frame of the paver (sometimes through a gantry extension).
1. *"High-angle" boom.*—A boom which can be inclined upward beyond the normal upward position of the standard boom to elevate the mixed batch to the point of placement.
- I. **TOWER ATTACHMENT.** Special equipment, replacing the bucket and boom, for elevating the mixed batch vertically.
- J. **BATCH CYCLE CONTROL.** A mechanism for controlling the functions of passing a batch through the paver with relation to designated time cycle.
- K. **OVERSIZE AUXILIARY WATER STORAGE TANK.** A tank to provide a greater reserve supply of water on the paver.
- L. **COOLING TANK.** A large tank serving to cool the water for the engine, in place of a radiator.
- M. **SKIP GUARD.** Members attached to the paver and extending along both sides of the skip, to reduce the danger of getting under the skip when it is in the elevated position.
- N. **COUNTERWEIGHT.** A counterbalance to preserve stability of the paver under all normal operating conditions.
- O. **STRIKE-OFF TEMPLATE.** A device for leveling the concrete to the desired elevation.
- P. **POWER MECHANISM FOR STRIKE-OFF (or "Template Puller").** A winch with its associated drive, clutch, and brake, driven and operated from the paver and used for pulling a strike-off template along the forms by a cable.
- Q. **OUTRIGGER ATTACHMENT FOR STRIKE-OFF CABLES.** An attachment placed on the paver when it is operating outside the forms to aline the strike-off cables along the center of the grade.
- R. **SUBGRADE TEMPLATE OR PLANNER.** A template supported on the forms, and sometimes attached to the paver when it is operating between the forms, for final leveling of the subgrade below the forms.
- S. **BATCH BOXES.** Boxes for holding the unmixed batch.
- T. **BATCH-BOX DERRICK.** A derrick with its associated drive and operating mechanisms, driven from the paver and mounted on the paver, for dumping the materials into the skip from batch boxes.

7. EFFECTIVE DATE

7.1 Having been passed through the regular procedure of the Commodity Standards Division, and approved by the acceptors hereinafter listed, this commercial standard was issued by the United States Department of Commerce, effective from October 1, 1950.

EDWIN W. ELY,
Chief, Commodity Standards Division.

8. HISTORY OF PROJECT

8.1 On December 19, 1947, the Mixer Manufacturers Bureau of the Associated General Contractors of America, Inc., requested the cooperation of the National Bureau of Standards in the establishment of a commercial standard for concrete mixers (construction mixers and pavers) for export trade.

8.2 Following receipt of this request, copies of a proposed commercial standard for concrete mixers for export trade were circulated on October 27, 1949, to selected representatives of manufacturers and exporters for advance comment. All comments were carefully considered, after which the standard was adjusted in accordance with the composite recommendations of those concerned, and circulated on April 28, 1950, to the entire trade for written acceptance.

8.3 Upon receipt of official acceptances estimated to represent a satisfactory majority of the production, by volume, for export, and in the absence of active valid opposition, the standard was approved for promulgation on June 27, 1950, as CS164E-50 (Export Classification).

Project Manager: E. C. Barrett, Commodity Standards Division, Office of Industry and Commerce.

Technical Adviser: L. R. Sweetman, Mechanics Division, National Bureau of Standards.

9. STANDING COMMITTEE

9.1 The following individuals comprise the membership of the standing committee, which is to review, prior to circulation for acceptance, revisions proposed to keep the standard abreast of progress. Comment concerning the standard and suggestions for revision may be addressed to any member of the committee or to the Commodity Standards Division, Office of Industry and Commerce, U. S. Department of Commerce, which acts as secretary for the committee.

E. H. LICHTENBERG, Koehring Co., 3026 West Concordia Avenue, Milwaukee 10, Wis. (Chairman).

J. D. FARRELL, The Foote Co., Inc., Nunda, N. Y.

A. W. FRITSCH, Chain Belt Company of Milwaukee, Milwaukee 4, Wis.

I. E. GAYLORD, Construction Machinery Division, Jaeger Machine Co., Columbus, Ohio.

JOHN P. GILSON, Gilson Bros. Co., Fredonia, Wis.

H. R. McDERMOTT, Construction Machinery Co., Waterloo, Iowa.

ROBERT W. SMITH, T. L. Smith Co., Milwaukee 10, Wis.

ACCEPTANCE OF COMMERCIAL STANDARD

If acceptance has not previously been filed, this sheet properly filled in, signed, and returned will provide for the recording of your organization as an acceptor of this commercial standard.

Date _____

Commodity Standards Division,
Office of Industry and Commerce,
U. S. Department of Commerce,
Washington 25, D. C.

Gentlemen:

We believe that the Commercial Standard 164E-50 constitutes a useful standard of practice, and we individually plan to utilize it as far as practicable in the

production ¹ export ¹ testing ¹

of concrete mixers (export classification).

We reserve the right to depart from it as we deem advisable.

We understand, of course, that only those articles which actually comply with the standard in all respects can be identified or labeled as conforming thereto.

Signature of authorized officer _____
(In ink)

(Kindly typewrite or print the following lines)

Name and title of above officer _____

Organization _____
(Fill in exactly as it should be listed)

Street address _____

City, zone, and State _____

¹ Underscore which one. Please see that separate acceptances are filed for all subsidiary companies and affiliates which should be listed separately as acceptors. In the case of related interests, trade associations, trade papers, etc., desiring to record their general support, the words "General Support" should be added after the signature.

TO THE ACCEPTOR

The following statements answer the usual questions arising in connection with the acceptance and its significance:

1. *Enforcement.*—Commercial standards for exports are commodity specifications voluntarily established by mutual consent of those concerned. They present a common basis of understanding between the producer, distributor, and consumer and should not be confused with any plan of governmental regulation or control. The United States Department of Commerce has no regulatory power in the enforcement of their provisions, but their provisions through usage soon become established as trade customs, and are made effective through incorporation into sales contracts by means of labels, invoices, and the like.

2. *The acceptor's responsibility.*—The purpose of commercial standards is to establish, for specific commodities, nationally recognized grades or consumer criteria, and the benefits therefrom will be measurable in direct proportion to their general recognition and actual use. Instances will occur when it may be necessary to deviate from the standard, and the signing of an acceptance does not preclude such departures; however, such signature indicates an intention to follow the commercial standard, where practicable, in the production or exportation of the article in question.

3. *The Department's responsibility.*—The major function performed by the Department of Commerce in the voluntary establishment of commercial standards for exports on a Nation-wide basis is fourfold: first, to act as an unbiased coordinator to bring all interested parties together for the mutually satisfactory adjustment of trade standards; second, to supply such assistance and advice as past experience with similar programs may suggest; third, to canvass and record the extent of acceptance and adherence to the standard on the part of producers and exporters; and fourth, after acceptance, to publish and promulgate the standard for the information and guidance of buyers and sellers of the commodity.

4. *Announcement and promulgation.*—When the standard for exports has been endorsed by a satisfactory majority of production in the absence of active, valid opposition, the success of the project is announced. If, however, in the opinion of the standing committee or of the Department of Commerce, the support of any standard is inadequate, the right is reserved to withhold promulgation and publication.

ACCEPTORS

The organizations listed below have individually accepted this standard for use as far as practicable in the production, distribution, testing, or purchase of concrete mixers. In accepting the standard, they reserved the right to depart therefrom as they individually deem advisable. It is expected that articles which actually comply with the requirements of this standard in all respects will be regularly indented or labeled as conforming thereto, and that purchasers will require such specific evidence of conformity.

FIRMS

Chain Belt Co., Milwaukee, Wis.
Construction Machinery Co., Waterloo, Iowa.
Foote Co., Inc., The, Nunda, N. Y.
Gilson Bros. Co., Fredonia, Wis.
Jaeger Machine Co., The, Columbus, Ohio.
Knickerbocker Co., The, Jackson, Mich.
Koehring Co., Milwaukee, Wis.
Kwik-Mix Co., Port Washington, Wis.
Noble Co., Oakland, Calif.

Northwest Tube & Metal Fabricators, Portland, Oreg.
Smith, T. L., Co., The, Milwaukee, Wis.
Worthington Pump & Machinery Corp., Harrison, N. J.

UNITED STATES GOVERNMENT

Agriculture, U. S. Department of, Division of Purchase, Sales & Traffic, Washington, D. C.
Army, U. S. Department of the, Washington, D. C.

COMMERCIAL STANDARDS

CS No.

- 0-40. Commercial standards and their value to business.
- 1-42. Clinical thermometers.
- 2-30. Mopsticks.
- 3-40. Stoddard solvent.
- 4-29. Staple porcelain (all-clay) plumbing fixtures.
- 5-46. Pipe nipples; brass, copper, steel, and wrought-iron.
- 6-31. Wrought-iron pipe nipples. Superseded by CS5-46.
- 7-29. Standard weight malleable iron or steel screwed unions.
- 8-41. Gage blanks.
- 9-33. Builders' template hardware.
- 10-29. Brass pipe nipples. Superseded by CS5-46.
- 11-41. Moisture regain of cotton yarns.
- 12-48. Fuel oils.
- 13-44. Dress patterns.
- 14-51. Boys' sport and dress shirt (woven fabrics) size measurements.
- 15-46. Men's pajama sizes (made from woven fabrics).
- 16-29. Wallpaper.
- 17-47. Diamond core drill fittings.
- 18-29. Hickory golf shafts.
- 19-32. Foundry patterns of wood.
- 20-49. Vitreous-china plumbing fixtures.
- 21-39. Interchangeable ground-glass joints, stopcocks, and stoppers.
- 22-40. Builders' hardware (nontemplate).
- 23-30. Feldspar.
- 24-43. Screw threads and tap-drill sizes.
- 25-30. Special screw threads. Superseded by CS24-43.
- 26-30. Aromatic red cedar closet lining.
- 27-36. Mirrors.
- 28-46. Cotton fabric tents, tarpaulins and covers.
- 29-31. Staple seats for water-closet bowls.
- 30-31. (Withdrawn.)
- 31-38. Wood shingles.
- 32-31. Cotton cloth for rubber and pyroxylin coating.
- 33-43. Knit underwear (exclusive of rayon).
- 34-31. Bag, case, and strap leather.
- 35-49. Hardwood plywood.
- 36-33. Fourdrinier wire cloth.
- 37-31. Steel bone plates and screws.
- 38-32. Hospital rubber sheeting.
- 39-37. (Withdrawn.)
- 40-32. Surgeons' rubber gloves.
- 41-32. Surgeons' latex gloves.
- 42-49. Structural fiber insulating board.
- 43-32. Grading of sulphonated oils.
- 44-32. Apple wraps.
- 45-48. Douglas fir plywood.
- 46-49. Hosiery lengths and sizes.
- 47-34. Marking of gold-filled and rolled-gold-plate articles other than watchcases.

CS No.

- 48-40. Domestic burners for Pennsylvania anthracite (underfeed type).
- 49-34. Chip board, laminated chip board, and miscellaneous boards for bookbinding purposes.
- 50-34. Binders board for bookbinding and other purposes.
- 51-35. Marking articles made of silver in combination with gold.
- 52-35. Mohair pile fabrics (100-percent mohair plain velvet, 100-percent mohair plain frieze, and 50-percent mohair plain frieze).
- 53-35. Colors and finishes for cast stone.
- 54-35. Mattresses for hospitals.
- 55-35. Mattresses for institutions.
- 56-49. Oak flooring.
- 57-40. Book cloths, buckrams, and impregnated fabrics for bookbinding purposes except library bindings.
- 58-36. Woven elastic fabrics for use in overalls (overall elastic webbing).
- 59-44. Textiles—testing and reporting.
- 60-48. Hardwood dimension lumber.
- 61-37. Wood-slat venetian blinds.
- 62-38. Colors for kitchen accessories.
- 63-38. Colors for bathroom accessories.
- 64-37. Walnut veneers.
- 65-43. Methods of analysis and of reporting fiber composition of textile products.
- 66-38. Marking of articles made wholly or in part of platinum.
- 67-38. Marking articles made of karat gold.
- 68-38. Liquid hypochlorite disinfectant, deodorant, and germicide.
- 69-38. Pine oil disinfectant.
- 70-41. Phenolic disinfectant (emulsifying type) (published with CS71-41).
- 71-41. Phenolic disinfectant (soluble type) (published with CS70-41).
- 72-38. Household insecticide (liquid spray type).
- 73-48. Old growth Douglas fir, Sitka spruce, and Western hemlock standard stock doors.
- 74-39. Solid hardwood wall paneling.
- 75-42. Automatic mechanical draft oil burners designed for domestic installations.
- 76-39. Hardwood interior trim and molding.
- 77-48. Enameled cast-iron plumbing fixtures.
- 78-40. Ground-and-polished lenses for sun glasses (published with CS79-40).
- 79-40. Blown, drawn, and dropped lenses for sun glasses (published with CS78-40).
- 80-41. Electric direction signal systems other than semaphore type for commercial and other vehicles subject to special motor vehicle laws (after market).
- 81-41. Adverse-weather lamps for vehicles (after market).

CS No.

- 82-41. Inner-controlled spotlamps for vehicles (after market).
- 83-41. Clearance, marker, and identification lamps for vehicles (after market).
- 84-41. Electric tail lamps for vehicles (after market).
- 85-41. Electric license-plate lamps for vehicles (after market).
- 86-41. Electric stop lamps for vehicles (after market).
- 87-41. Red electric warning lanterns.
- 88-41. Liquid burning flares.
- 89-40. Hardwood stair treads and risers.
- 90-49. Power cranes and shovels.
- 90E-47. Power cranes, and shovels, convertible full-revolving type; crawler, truck and wheel mounted; including clamshell, dragline, lifting crane, hoe, pile driver, and skimmer scoop operating equipment (export classifications).
- 91-41. Factory-fitted Douglas fir entrance doors.
- 92-41. Cedar, cypress and redwood tank stock lumber.
- 93-50. Portable electric drills (exclusive of high frequency).
- 94-41. Calking lead.
- 95-41. Lead pipe.
- 96-41. Lead traps and bends.
- 97-42. Electric supplementary driving and passing lamps for vehicles (after market).
- 98-42. Artists' oil paints.
- 99-42. Gas floor furnaces—gravity circulating type.
- 100-47. Porcelain-enameled steel utensils.
- 101-43. Flue-connected oil-burning space heaters equipped with vaporizing pot-type burners.
- 102- . (Reserved for "Diesel and fuel-oil engines.")
- 102E-42. Diesel and fuel oil engines (export classifications).
- 103-48. Rayon jacquard velour (with or without other decorative yarn).
- 104-49. Warm-air furnaces equipped with vaporizing type oil burners.
- 105-48. Mineral wool insulation for low temperatures.
- 106-44. Boys' pajama sizes (woven fabrics).
- 107-45. (Withdrawn.)
- 108-43. Treading automobile and truck tires.
- 109-44. Solid-fuel-burning forced-air furnaces.
- 110-43. Tire repairs—vulcanized (passenger, truck, and bus tires).
- 111-43. Earthenware (vitrecus-glazed) plumbing fixtures.
- 112-43. Homogeneous fiber wallboard.
- 113-44. Oil-burning floor furnaces equipped with vaporizing pct-type burners.
- 114-43. Hospital sheeting for mattress protection.
- 115-44. Porcelain-enameled tanks for domestic use.
- 116-44. Bituminized-fibre drain and sewer pipe.
- 117-49. Mineral wool insulation for heated industrial equipment.
- 118-44. Marking of jewelry and novelties of silver.
- (E) 119-45.¹ Dial indicators (for linear measurements).
- 120-48. Standard stock ponderosa pine doors.
- 121-45. Women's slip sizes (woven fabrics).
- 122-49. Western softwood plywood.
- 123-49. Grading of diamond powder.
- (E) 124-45.¹ Master disks.
- 125-47. Prefabricated homes.
- 126-45. Tank-mounted air compressors.

¹ Where "(E)" precedes the CS number, it indicates an emergency commercial standard, drafted under war conditions with a view toward early revision.

CS No.

- 127-45. Self-contained mechanically refrigerated drinking water coolers.
- 128-49. Men's sport shirt sizes—woven fabrics (other than those marked with regular neckband sizes).
- 129-47. Materials for safety wearing apparel.
- 130-46. Color materials for art education in schools.
- 131-46. Industrial mineral wool products, all types—testing and reporting.
- 132-46. Hardware cloth.
- 133-46. Woven wire netting.
- 134-46. Cast aluminum cooking utensils (metal composition).
- 135-46. Men's shirt sizes (exclusive of work shirts).
- 136-46. Blankets for hospitals (wool, and wool and cotton).
- 137-46. Size measurements for men's and boys' shorts (woven fabrics).
- 138-49. Insect wire screening.
- 139-47. Work gloves.
- 140-47. Testing and rating convectors.
- 141-47. Sine bars, blocks, plates, and fixtures.
- 142-47. Automotive lifts.
- 143-47. Standard strength and extra strength perforated clay pipe.
- 144-47. Formed metal porcelain enameled sanitary ware.
- 145-47. Testing and rating hand-fired hot-water-supply boilers.
- 146-47. Gowns for hospital patients.
- 147-47. Colors for molded urea plastics.
- 148-50. Men's circular flat- and rib-knit rayon underwear.
- 149-48. Utility type house dress sizes.
- 150-48. Hot-rolled rail steel bars (produced from Tee-section rails).
- 151-48. Body measurements for the sizing of apparel for infants, babies, toddlers, and children (for the knit underwear industry).
- 152-48. Copper naphthenate wood-preservative (spray, brush, dip application).
- 153-48. Body measurements for the sizing of apparel for girls (for the knit underwear industry).
- 154- . (Reserved for "Wire rope".)
- 154E-49. Wire rope (export classification).
- 155-50. Body measurements for the sizing of boys' apparel (knit underwear, shirts, trousers).
- 156-49. Colors for polystyrene plastics.
- 157-49. Ponderosa pine and sugar pine plywood.
- 158-49. Model forms for girls' apparel.
- 159-49. Sun glass lenses made of ground and polished plate glass, thereafter thermally curved.
- 160-49. Wood-fiber blanket insulation (for building construction).
- 161-49. "Standard grade" hot-dipped galvanized ware (coated after fabrication).
- 162-49. Tufted bedspreads.
- 163-49. Standard stock ponderosa pine windows, sash, and screens.
- 164- . (Reserved for "Concrete mixers".)
- 164E-50. Concrete mixers (construction mixers and pavers) (export classification).
- 165-50. Zinc naphthenate wood-preservative (spray, brush, dip application).
- 166-50. Size measurements for men's work trousers.
- 167-50. Automotive and general service copper tube.
- 168-50. Polystyrene plastic wall tiles, and adhesives for their application.
- 169-50. Galvanized ware fabricated from pregalvanized steel sheets.
- 170-50. Cotton flour-bag (sack) towels.
- 171-50. Hardwood veneered doors.
- 172-50. Brass trim for water-closet bowls, tanks, and urinals (dimensional standards).

NOTICE.—Those interested in commercial standards with a view toward accepting them as a basis of everyday practice may secure copies of the above standards, while the supply lasts, by addressing the Commodity Standards Division, Office of Industry and Commerce, U. S. Department of Commerce, Washington 25, D. C.

COMMERCIAL STANDARDS PRINTED IN SPANISH

CS No.

- 17-42. Accesorios de perforadora sacanúcleos de punta de diamante o romboidal (tercera edición).
- 20-42. Muebles o artefactos sanitarios de loza vitrea, de uso general.
- 21-39. Uniones, espitas y tapones intercambiables de vidrio esmerilado.
- 68-38. Hipoclorito líquido desinfectante, deodorante y germicida.
- 69-38. Desinfectante de aceite de pino.
- 70-41. Desinfectante fenólico (tipo emulsionante).
- 71-41. Desinfectante fenólico (tipo soluble).
- 72-38. Insecticida de uso doméstico (tipo líquido para pulverizaciones).

CS No.

- 77-40. Artículos sanitarios de hierro fundido esmaltados.
- 90E-47. Grúas y palas mecánicas convertibles de tipo completamente giratorio: montadas sobre rodado a orugas y sobre ruedas; inclusive palas de cucharón de almeja, dragas de arrastre, grúas para izar, azadón, martinete, razadora y otros equipos de funcionamiento (clasificaciones para exportación).
- 102E-42. Motores diesel y de aceite combustible. (Clasificaciones para exportación).
- 116-44. Tubería de fibra bituminizada para desagües y alcantarillas.
- 142-47. Levantadores de automóviles.

COMMERCIAL STANDARDS PRINTED IN PORTUGUESE

CS No.

- 21-39. Juntas, torneiras e batoques alternáveis de vidro esmerilado.
- 68-38. Hipoclorito líquido, desinfetante, desodorante e germicida.
- 69-38. Desinfetante de óleo de pinho.
- 70-41. Desinfetante fenólico (tipo emulsionante) publicado com CS71-40).
- 70-41. Desinfetante fenólico (tipo, soluvel) publicado com CS70-41).
- 72-38. Inseticida de uso doméstico (tipo líquido para pulverização).
- 77-40. Artigos sanitários de ferro fundido esmaltados.

CS No.

- 90E-47. Guindastes e pás mecânicas, conversíveis, do tipo de giro completo; montadas sobre truques de esteiras, caminhão e rodas; incluindo equipamento de caçamba de mandíbulas, pá de arrasto, guindaste, pá invertida, bate-estacas e raspadeira (classificação para exportação).
- 102E-42. Motores Diesel e a óleo combustive (classificações para exportação).
- 116-44. Tubos de fibras betuminadas para drenagem e esgotos.

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DEPARTMENT OF COMMERCE

National Bureau of Standards . .

VOLUNTARY PRODUCT STANDARDS

Notice of Action on Proposed
Withdrawal

In accordance with § 10.12 of the Department of Commerce Procedures for the Development of Voluntary Product Standards (15 CFR Part 10, as amended; 35 F.R. 8340 dated May 23, 1970), notice is hereby given of the withdrawal of 111 Voluntary Product Standards identified below, including 78 standards identified as "Simplified Practice Recommendations" (R), and 33 standards previously identified as "Commercial Standards" (CS). Each of these standards has been found to be obsolete, technically inadequate, no longer acceptable to and used by the industry, or otherwise not in the public interest.

Public notice of the Department's intention to withdraw these standards was published in the Federal Register on February 10, 1971 (36 F.R. 2813), and a 45-day period was provided for the submission of comments or objections concerning the proposed withdrawal of any of these standards. No objections to the Department's intention of withdrawing any of these standards have been received by the National Bureau of Standards.

The effective date for the withdrawal of these standards will be 60 days after the publication of this notice. This withdrawal action terminates the authority to refer to these standards as Voluntary Product Standards developed under the Department of Commerce Procedures.

- R 4-36... Asphalt.
- R 8-50... Ferrous range boilers, expansion tanks, and solar tanks.
- R 9-47... Galvanized woven-wire fencing and barbed wire.
- R 10-37... Asbestos paper and asbestos millboard.
- R 21-46... Lavatory and sink traps.
- R 23-54... Plow bolts.
- R 26-50... Steel reinforcing bars.
- R 35-44... Steel lockers.
- R 38-37... Sand-lime brick.
- R 49-26... Sidewalk, floor, and roof lights.
- R 59-27... Rotary-cut lumber stock for wire-bound boxes.
- R 63-28... Metal spools (for annealing, handling and shipping wire).
- R 65-31... Packaging of overhead electric railway material.
- R 67-36... Taper roller bearings.
- R 68-41... Metal and nonconducting flashlight cases.
- R 69-27... Packaging of razor blades.
- R 71-28... Turnbuckles.
- R 74-49... Hospital and institutional cotton textiles.
- R 75-29... Composition blackboard.
- R 80-28... Folding and portable wooden chairs.
- R 82-28... Hollow metal single-acting swing doors, frames and trim.
- R 83-28... Kalamain single acting swing doors, frames, and trim.
- R 88-37... Floor sweeps.
- R 89-55... Coated abrasive products.
- R 92-38... Hard fiber twine and lath yarn (ply and yarn goods).
- R 93-30... Paper shipping tags.
- R 94-53... Open-web steel joists and open-web malleable steel joists.
- R 95-30... Skid platforms.
- R 97-47... Bell-bottom screw jacks.
- R 101-40... Metal partitions for toilets and showers.
- R 102-33... Granite curbstone.
- R 105-32... Wheelbarrows.
- R 107-31... Glassine bags.
- R 110-29... Soft fiber (jute) twine.
- R 112-29... Elastic shoe goring.
- R 115-30... Pull-disk building wheels.
- R 119-31... Fast-selvaige terry towels.
- R 122-31... Wire insect-screen cloth.
- R 123-43... Carbonated beverage bottles.
- R 124-31... Polished cotton twine.
- R 126-41... Set-up paper boxes (used by department and specialty stores).
- R 127-41... Folding paper boxes (used by department and specialty stores).
- R 128-41... Corrugated fiber boxes (used by department and specialty stores).
- R 131-35... Glass containers for mayonnaise.
- R 138-32... Dental rubber (base and veneering).
- R 145-33... Packaging of electric railway motor and controller parts.
- R 154-38... Cupola refractories.
- R 156-41... Extracted honey packages.
- R 158-42... Forged axes.
- R 159-42... Forged hammers.
- R 160-42... Forged hatchets.
- R 161-35... Packaging of automotive (bus) engine parts.
- R 166-37... Color code for marking steel bars.
- R 169-45... Bolts and nuts (stock production sizes).
- R 171-38... Wooden boxes for canned fruits and vegetables.
- R 172-54... Stock folding boxes for garments and dry cleaning.
- R 177-41... Single-faced corrugated board rolls (used by department and specialty stores).
- R 178-41... First-aid unit dressings and treatments (packaging of).
- R 181-41... Nonferrous range boilers.
- R 188-54... Spring and slotted clothespins (sizes and packaging).
- R 189-42... Round and flat hardwood toothpicks (sizes and packaging).
- R 196-42... Glass containers for green olives.
- R 199-43... Cloth window shades.
- R 201-43... Iron and steel pop safety valves.
- R 202-48... Tank-mounted air compressors (1/4 to 10 horsepower).
- R 203-44... Containers and packages for household insecticides (liquid spray type).
- R 204-44... Bronze pop safety valves, and bronze, iron and steel relief valves.
- R 205-44... Iron and steel relief valves for petroleum, chemical and general industrial services.
- R 209-45... Peanut butter packages and containers.
- R 212-45... Cast brass solder-joint fittings.
- R 215-46... Luggage (trunks and suitcases).
- R 219-46... Automatic regulating valves.
- R 232-48... Low-pressure lubricating devices.
- R 233-48... Rotary files and burs.
- R 234-18... Welded-wire fabric reinforcement concrete pipe.
- R 249-52... Plastic tableware.
- R 253-54... Retail container sizes for frozen fruits and vegetables.
- R 266-63... Gypsum board products.
- CS 8-40... Stoddard solvents (dry cleaning).
- CS 7-29... Standard weights malleable iron or steel screwed unions.
- CS 10-32... Foundry patterns of wood.
- CS 32-31... Cotton cloth for rubber and pyroxylin coating.
- CS 36-33... Fourdrinier wire cloth.
- CS 48-40... Domestic burners for Pennsylvania anthracite (underfed type).
- CS 56E-41... Oak flooring (exports).
- CS 59-41... Textiles-testing and reporting.
- CS 62-38... Colors for kitchen accessories.
- CS 63-38... Colors for bathroom accessories.
- CS 68-38... Liquid phyochlorite disinfectant, deodorant, and germicide.
- CS 93-50... Portable electric drills (exclusive of high frequency).
- CS 94-41... Calking lead.
- CS 95-41... Lead pipe.
- CS 96-41... Lead traps and bends.
- CS 102E-42... Diesel and fuel-oil engines (export classifications).
- CS 108-43... Treading automobile and truck tires.
- CS 110-43... Tire repairs—vulcanized (passenger, truck, and bus tires).
- CS 112-43... Homogeneous fiber wall-board.
- CS E124-45... Master disks.
- CS 126-56... Tank-mounted air compressors (classification and testing).
- CS 139-47... Work gloves.
- CS 154E-49... Wire rope (export classifications).
- ✓CS 164E-50... Concrete mixers (export classifications).
- CS 170-50... Cotton flour-bag (sack) towels.
- CS 175-51... Circular-knitted gloves and mittens.
- CS 179-51... Installation of attic ventilation fans in residences.
- CS 181-52... Water-resistant organic adhesives for installation of clay tile.
- CS 212-57... Steel sliding closet door and frame units.
- CS 213-57... Steel knockdown sliding closet door units (for wood frame installation).
- CS 221-59... Gel-coated glass-fiber-reinforced polyester resin bathtubs.
- CS 222-59... Gel-coated glass-fiber-reinforced polyester resin shower receptors.
- CS 229-60... Copper drainage tube (DWV).

LEWIS M. BRANSCOMB,
Director.

APRIL 15, 1971.

Approved: April 19, 1971.

JAMES H. WAKELIN, Jr.,
Assistant Secretary
for Science and Technology.

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